

The influence of coping, perceptions of limitations, interference, and locus of control on concussion care-seeking intentions in collegiate athletes

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The Influence
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Care-Seeking Intentions in Collegiate Athletes
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Dear Ms. Anderson,

Reviewers have now commented on your paper. You will see that they are advising that you revise your manuscript. If you are prepared to undertake the work required, I would be pleased to reconsider my decision.

For your guidance, reviewers' comments are appended below.

If you decide to revise the work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript. Also, please ensure that the track changes function is switched on when implementing the revisions. This enables the reviewers to rapidly verify all changes made.

Your revision is due by Mar 15, 2020.

To submit a revision, go to <https://www.editorialmanager.com/jctres/> and log in as an Author. You will see a menu item call Submission Needing Revision. You will find your submission record there.

Yours sincerely

Nicholas G Murray, Ph.D.
Editorial Board Member
Journal of Clinical and Translational Research

Reviewers' comments:

Reviewer #1: Very well-written paper and commend the authors on exploring more behavioral areas that have yet to be investigated in SRC research. Minor edits regarding the quality of the introduction and discussion, which need some revamping of relevant literature. Please see individual line edits below.

Abstract: Be careful using such a strong statement that we should not focus extensively, especially when that statement is not made in the actual conclusion. Suggest rewording similarly to conclusion paragraph.

Intro line 16-21: Why the cumulative effects research here? This does not support or compliment your specific aims, and I have a difficult time relating cumulative effects to your purpose and aims.

Specific Aim #1 needs to be brought out more in the introduction and a lot of literature has been left out. Multiple studies on sex and reporting/behaviors. (Sullivan et al. 2018, Wallace et al., 2017, Miyashita et al. 16).

Line 44-5q before aims paragraph: please cite.

Line 60: provide hypothesis for SA1.

Methods, Line 27-29: Delete, as unnecessary.

Line 36-43: This is confusing here. This is a 1-time survey, with the follow-up surveys, unrelated to the analyses of this study. Recommend deleting this entire part as it is not connected to the current study.

Results, Line 49: Fix at least one of, because this is the only survey that matters for this paper.

Care seeking results, line 36: fix p to <.001)

Group comparisons, line 51: correct space before (p=0.04)

Line 54: No significant differences between division level? Next page line 47 you say that there out differences...

Discussion: Need to tie back care seeking with previous literature on behavior and attitudes. Additionally, need to address sex from the current study to previous literature.

in discussion, care seeking, contact levels are supported by concussion research. However, in the paragraph above perceptions of limitations, only citation is a 1969 article. Please support these results with current findings or hypotheses with current findings. Suggest multiple findings for each too.

Suggest explaining academic accommodations and return to school/learn in the discussion, as results from perceptions reflect these protocols.

Limitations, Line 13: fix for just this survey. preseason? Before sport?

Line 20: If not accounting for history of concussion, more reason to remove that piece from your introduction. However it seems that this may be vital for perception of limitation. For example, does this become a behavior or attitude picked up by other athletes/teammates?

Include a statement for how these results are clinical and translational, as that remains unclear.

References: fix McCrea caps

Reviewer #2: General Comments:

This article present a unique approach to examine some barriers on how student-athletes in the collegiate setting may or may not seek care. It adds to this growing body of literature but requires some substantial edits prior to being published.

First, the writing of the introduction is very choppy with a mix of moving from large to small idea and then from small to big idea. This creates a manuscript that is difficult to read and is not fully coherent with the other written sections. The latter paragraphs go from main idea to main idea with very little transition and/or flow. I am recommending an entire rewrite of the introduction that should mirror or match the discussion.

Second, the psychometrics of the particular survey items should be explicitly reported rather than simply stated as good or sufficient with a certain citation. It is recommended that a Table be created to house all of this important information, which should include the developed survey items.

Third, the discussion is missing the major "why should we care" aspect. It consistently courts the main idea but never directly moves to the point. Thus, a clinical implications that is straight and to the point must be included in this section along with major key points in the discussion opening paragraph.

Specific Comments:

Abstract:

P2, L11 - please adjust the word poorer to something like severe or longer.

P2, L35 - please adjust the wording from "...this association was weak"

P2, L40 - The relevance for patients appears to be missing "by" after "...largely"

Graphical Abstract:

Same comment from the abstract on the "Main Take-Away" - it is missing "by"

Introduction:

P4, L42 - what exactly do you mean by variance? Variance is a very specific term and I don't think is appropriate in this sentence. Please adjust.

P4, L44 - then why exactly do we care? The following sentence after multifactorial does not really elaborate on the why in this circumstance. Please adjust.

P4, L55 - this paragraph is not sufficiently long enough to be considered a paragraph. Please adjust.

P5, L20 - this sentence starting with "A falsely amplified.." is a bit wordy and can be condense. Please adjust.

P5, L24 - are the authors certain of this? No literature exists at all on this topic? It is safer to assume that the authors do not know of any existing literature on this topic. Please use less definitive terms.

P5, L33 - please refrain from using definitions in a scientific article. Simply summarize or tell us the exact thoughts/aspect you are wanting to convey to the readers. Using words like "...is defined as" can be completely removed.

P6, L4 - the hypothesis seems very generic, why did this hypothesis get generated? Please clarify and adjust if it is not data driven.

Methods:

P6, L18 - please give a total number of universities or division level schools that were recruited.

P6, L38 - what is SMS? You cannot ever assume readers understand who/what you are referring to. Secondly, is this a valid way of reminder participants to engage in the research? Please address.

P6, L42 - no information is given about the order of how the surveys were delivered. Please elaborate as this could lead to biasing your participants.

Results:

P10, L33 - why include two different p-values in this section? It is unclear what the p-value is referring to and why.

Discussion:

P11, L29-47 - unfortunately, this whole section fails to inform the readers of the major findings of your study. This area of the discussion is a unique opportunity to inform the readers of your most important why should we care outcomes. Please give your readers some key points that are then elaborated on in the discussion section.

Author's response

Reviewers' comments:

Reviewer #1: Very well-written paper and commend the authors on exploring more behavioral areas that have yet to be investigated in SRC research. Minor edits regarding the quality of the introduction and discussion, which need some revamping of relevant literature. Please see individual line edits below.

Abstract: Be careful using such a strong statement that we should not focus extensively,

especially when that statement is not made in the actual conclusion. Suggest rewording similarly to conclusion paragraph. **We have revised the statement to use less definitive terms and now reads “We may not need to focus extensively on coping, perceptions of limitations, perceptions of interference and locus of control ratings when creating concussion education since none of these variables significantly predicted care-seeking intentions.”** (pg. 2, line 23)

Intro line 16-21: Why the cumulative effects research here? This does not support or compliment your specific aims, and I have a difficult time relating cumulative effects to your purpose and aims. **Thank you for your suggestion. Upon review, we agree with your comment and the sentence highlighting cumulative effects of multiple concussions has been removed. The introductory paragraph now reads: “Sport-related concussions continue to present a public health burden for student-athletes at all levels of participation (1). Although concussions rates are rising at all levels of play (2), troubling data still suggests that approximately 50% of all sport-related concussions go unreported, and therefore undiagnosed and untreated (Llewellyn, Burdette, Joyner, & Buckley, 2014; McCrea et al., 2005; Register-Mihalik et al., 2013). Deleterious long-term effects resulting from unreported concussions may be mitigated if athletes seek timely care from a trained health care professional.”** (pg. 3, line 1-12)

Specific Aim #1 needs to be brought out more in the introduction and a lot of literature has been left out. Multiple studies on sex and reporting/behaviors. (Sullivan et al. 2018, Wallace et al., 2017, Miyashita et al. 16). **Thank you for suggesting those articles. We have now integrated their findings into our introduction and cite those authors. Specifically, “Researchers have attempted to identify reasons for the discrepancy in the estimated prevalence of concussion versus actual prevalence by examining factors such as perceived pressure from stakeholders, ability to recognize symptoms, sex disclosure differences and attitudes toward care-seeking (6,7,7-12)”** (pg. 3, lines 7-12)

Line 44-5q before aims paragraph: please cite. **We have added a citation for the statement outlining locus of control (13,14).** (pg 4, line 7-8)

Line 60: provide hypothesis for SA1. The hypothesis now reads **“We hypothesize that coping, perceptions of limitations, perceptions of interference and locus of control will be significantly different between division level, contact level and sex.”** (pg. 4, lines 19-23)

Methods, Line 27-29: Delete, as unnecessary. **Thank you for your suggestion. We removed that sentence from the methods.**

Line 36-43: This is confusing here. This is a 1-time survey, with the follow-up surveys, unrelated to the analyses of this study. Recommend deleting this entire part as it is not connected to the current study. **We have rewritten those lines to try to make our methodology more clear. The text now reads: “Athletes who consented to be part of the research study received a series of monthly surveys via text messages that were sent on**

the first day of every month from July-September 2018. The three surveys from this study were administered separately across three sequential months in the following order; perceptions of limitations and perceptions of interference, brief cope, and locus of control. Combined survey duration was estimated to last approximately fifteen minutes. An additional text message reminder was sent to those who did not complete survey two days following initial distribution. All student-athletes who completed at least 80% of the 12 monthly surveys received a small monetary incentive.” (pg. 5, lines 6-13)

Results, Line 49: Fix at least one of, because this is the only survey that matters for this paper. **A total of 204 student-athletes (92 males (45.1%), 112 females (54.9%)) completed at least one of the three surveys.** Student-athlete descriptive and demographic data are presented in Table 3. (pg. 8, line 18-19)

Care seeking results, line 36: fix p to <.001) **Our p-value was changed to p<.001.** (pg. 9, line 13)

Group comparisons, line 51: correct space before (p=0.04) **A space has been added and now reads “...contact athletes (p=0.04).”** (pg. 9, line 19)

Line 54: No significant differences between division level? Next page line 47 you say that there are differences... **Thank you for pointing this discrepancy out. Yes, this was an error we made and we have thoroughly reviewed the manuscript to ensure that there are no more conflicting statements. We found significant differences between males and females and contact level not division level and the manuscript now reflects this.**

Discussion: Need to tie back care seeking with previous literature on behavior and attitudes. Additionally, need to address sex from the current study to previous literature. **We have added references to previous literature that examined differences in concussion-reporting behaviors between the sexes. Our discussion (pg. , line) now reads “Specifically, female athletes have been documented to be more likely to report concussion symptoms (10–12) and the current study yielded similar results with our finding that female student-athletes had significantly higher intentions to seek care for their concussion symptoms than males.”** (pg. 11, line 2-6)

in discussion, care seeking, contact levels are supported by concussion research. However, in the paragraph above perceptions of limitations, only citation is a 1969 article. Please support these results with current findings or hypotheses with current findings. Suggest multiple findings for each too. **We have updated the paragraph to include more recent publications as highlighted in the following excerpt: “Many contact sports rely on working with teammates to achieve an objective (e.g. scoring a goal) and, regardless of the strength of an individual athlete, the final outcome of the event depends on the**

actions of the group, not the individual (15). Conversely, non-contact sports are often based on the performance of the individual (e.g. cross-country, tennis, swim and dive) (16,17) with these athletes reporting higher internal locus of control ratings (13,18).” (pg. 12, line 5-11)

Suggest explaining academic accommodations and return to school/learn in the discussion, as results from perceptions reflect these protocols. We have incorporated your suggestion and the discussion now includes the following statement “Based on these concerns related to academic performance following concussion, it is critical that we educate athletes and stakeholders on the importance of return to school/learn after concussion as well as make sure that academic accommodations and adjustments are provided when needed (19).” (pg. 12, line 17-20)

Limitations, Line 13: fix for just this survey. preseason? Before sport? Thank you for your suggestion. We have updated the limitations to read “This study is not without limitations. Our care-seeking intentions survey was administered pre-season at a single time point and the three follow-up surveys were distributed over the course of one year. It is possible that a student-athletes care-seeking intentions evolved and changed over time (20).” (pg. 13, line 8-15)

Line 20: If not accounting for history of concussion, more reason to remove that piece from your introduction. However it seems that this may be vital for perception of limitation. For example, does this become a behavior or attitude picked up by other athletes/teammates? We have updated the limitations section to read “While we accounted for concussions that occurred over the course of the data collection period, we did not account for a previous history of concussion which could have inflated an athlete’s knowledge of the injury. Specifically, previous exposure to concussion may alter an athlete’s perception of how limited they would be following a concussion and may have greatly influenced their survey responses.” (pg. 13, line 11-15)

Include a statement for how these results are clinical and translational, as that remains unclear. We have added the following sentence “Our findings are clinical and translation in nature as improved understanding of these psychological constructs helps clinicians determine which factors influence concussion-reporting intentions when managing potentially concussed collegiate student-athletes.” (pg. 13, line 21-22)

References: fix McCrea caps McCrea has been formatted properly.

Reviewer #2: General Comments:

This article present a unique approach to examine some barriers on how student-athletes in the collegiate setting may or may not seek care. It adds to this growing body of literature but requires some substantial edits prior to being published.

First, the writing of the introduction is very choppy with a mix of moving from large to small idea and then from small to big idea. This creates a manuscript that is difficult to read and is not fully coherent with the other written sections. The latter paragraphs go from main idea to

main idea with very little transition and/or flow. I am recommending an entire rewrite of the introduction that should mirror or match the discussion.

Thank you for your comment. This introduction was difficult to write due to the breadth of independent variables we were investigating. The authorship team has reviewed the introduction again and made several changes to improve the flow of the introduction.

Second, the psychometrics of the particular survey items should be explicitly reported rather than simply stated as good or sufficient with a certain citation. It is recommended that a Table be created to house all of this important information, which should include the developed survey items. **We have added information specific to the reliability of the care-seeking intentions survey and the text now reads: "These measures were derived by Kroshus et al. (2016) and Register-Mihalik (2013) and have high internal consistency (Cronbach $\alpha = .89$) (5,7)" (pg. 7, line 20-23)**

Third, the discussion is missing the major "why should we care" aspect. It consistently courts the main idea but never directly moves to the point. Thus, a clinical implications that is straight and to the point must be included in this section along with major key points in the discussion opening paragraph.

Thank you for your feedback. The discussion is addressed in much greater detail on page 6 of our reviewer comments. In addition, we have added the following sentence "Our findings are clinical and translation in nature as improved understanding of these psychological constructs helps clinicians determine which factors influence concussion-reporting intentions when managing potentially concussed collegiate student-athletes." (pg. 13, line 21-22)

Specific Comments:

Abstract:

P2, L11 - please adjust the word poorer to something like severe or longer. **"Athletes who delay seeking care for a suspected concussion can experience longer recovery outcomes"**

P2, L35 - please adjust the wording from "...this association was weak" .**The sentence reads "There was a weak positive association between perceptions of limitations and symptom care-seeking intentions ($r_s(198)=0.23, p<0.01$) and concussion care-seeking intentions ($r_s(198)=0.15, p<0.05$)." (pg. 3, line 20-22)**

P2, L40 - The relevance for patients appears to be missing "by" after "...largely" **"Care-seeking intentions for concussion do not appear to be influenced largely by these variables." (pg 2, line 26)**

Graphical Abstract:

Same comment from the abstract on the "Main Take-Away" - it is missing "by" **Thank you for bringing that to our attention. That edit has been made to the graphical abstract.**

Introduction:

P4, L42 - what exactly do you mean by variance? Variance is a very specific term and I don't think is appropriate in this sentence. Please adjust. **We have revised the sentence and it now reads "However, most studies explain only small proportion of concussion care-seeking intentions, suggesting that this health behavior is multifactorial."** (pg. 3, line 12-13)

P4, L44 - then why exactly do we care? The following sentence after multifactorial does not really elaborate on the why in this circumstance. Please adjust. **We have included the following sentence to highlight the importance of our study: "To improve concussion care-seeking intentions we must continue to determine why student-athletes choose to not seek care following concussion."** (pg. 3, line 13-15)

P4, L55 - this paragraph is not sufficiently long enough to be considered a paragraph. Please adjust. **Thank you for your suggestion. We have combined the paragraph about coping behaviors with the succeeding paragraph on perceptions of limitations and perceptions of interference.**

P5, L20 - this sentence starting with "A falsely amplified.." is a bit wordy and can be condense. Please adjust. **We have revised the sentence to be more concise and now reads: "A falsely amplified perception of how limited they would be if they report a concussion may deter an athlete from seeking care."** (pg 3-4, lines 26-4)

P5, L24 - are the authors certain of this? No literature exists at all on this topic? It is safer to assume that the authors do not know of any existing literature on this topic. Please use less definitive terms. **We have updated the statement to use less definitive terms and now reads "To the best of our knowledge, there is a current lack of literature addressing how athletes perceive limitations following concussion and how those limitations might influence their concussion care-seeking intentions."** (pg 4, line 2-4)

P5, L33 - please refrain from using definitions in a scientific article. Simply summarize or tell us the exact thoughts/aspect you are wanting to convey to the readers. Using words like "...is defined as" can be completely removed. **Thank you for your suggestion, we have changed this throughout. "Finally, locus of control is the fundamental appraisal of one's self and is commonly used in personality psychology (13)."** (pg 3, line 7-8)

P6, L4 - the hypothesis seems very generic, why did this hypothesis get generated? Please clarify and adjust if it is not data driven. **This hypothesis was generated a priori and was not data driven.**

Methods:

P6, L18 - please give a total number of universities or division level schools that were

recruited. We have specified the number of universities and the methods now read “Student-athletes participating in National Collegiate Athletics Association (United States) sanctioned sports **at three universities** across three divisions of play ([university names blinded for peer review]: Division I, [x]: Division II, [x]: Division III, [x]:) were recruited to participate in the study during their annual concussion education session administered via an online module.” (pg. 4, line 2)

P6, L38 - what is SMS? You cannot ever assume readers understand who/what you are referring to. The term SMS has been removed and replaced with the more accessible term text message. “**An additional text message reminder was sent to those who did not complete survey two days following initial distribution.**” (pg 5, lines 11-13)

Secondly, is this a valid way of reminder participants to engage in the research? Please address. We appreciate your concern on this matter. Our study protocol of sending reminder text messages to participants was approved by an Institutional Review Board.

P6, L42 - no information is given about the order of how the surveys were delivered. Please elaborate as this could lead to biasing your participants. We have updated the methods to explicitly state the order that the surveys were administered and now read “**Athletes who consented to be part of the research study received a series of monthly surveys via text messages that were sent on the first day of every month from July-September 2018. The three surveys from this study were administered separately across three sequential months in the following order; perceptions of limitations and perceptions of interference, brief cope, and locus of control. Combined survey duration was estimated to last approximately fifteen minutes. An additional text message reminder was sent to those who did not complete survey two days following initial distribution. All student-athletes who completed at least 80% of the 12 monthly surveys received a small monetary incentive.**” (pg. 5, line 6-14)

Results:

P10, L33 - why include two different p-values in this section? It is unclear what the p-value is referring to and why. The sentence has been revised for clarity and now reads “**Symptom care-seeking intentions ($p=0.64$) and concussion care-seeking intentions ($p=0.82$) did not significantly differ between division levels.**” (pg 9, lines 10-11)

Discussion:

P11, L29-47 - unfortunately, this whole section fails to inform the readers of the major findings of your study. This area of the discussion is a unique opportunity to inform the readers of your most important why should we care outcomes. Please give your readers some key points that are then elaborated on in the discussion section.

Thank you for your suggestion. We have revised the introductory paragraph to the discussion to now read the following:

“Overall, the key finding of this study is that care-seeking intentions for student-athletes were not significantly predicted by any of the sub-score on the Brief Cope, the perceptions of limitations and perceptions of interference, or the Locus of Control survey. However, our research did yield several interesting findings, specifically differences between males and females and contact level, outlined in the following sections. This study supports existing literature that found that many factors influence a student-athletes intentions to report a suspected concussion to sports medicine professionals (6–8,11,12,21–24).” (pg. 10, line 9-17)

Following this paragraph, we break the discussion out into the following major themes; *Care-Seeking Intentions and Survey Response Differences Between Males and Females, Differences Between Contact Levels, and Perceptions of limitations, perceptions of interference.*

2nd Editorial decision

14-Apr-2020

Ref.: Ms. No. JCTRes-D-19-00037R1

The Influence of Coping, Perceptions of Limitations, Interference, and Locus of Control on Concussion Care-Seeking Intentions in Collegiate Athletes
Journal of Clinical and Translational Research

Dear authors,

I am pleased to inform you that your manuscript has been accepted for publication in the Journal of Clinical and Translational Research.

You will receive the proofs of your article shortly, which we kindly ask you to thoroughly review for any errors.

Thank you for submitting your work to JCTR.

Kindest regards,

Nicholas G Murray, Ph.D.
Editorial Board Member
Journal of Clinical and Translational Research

Comments from the editors and reviewers:

Reviewer #2: Dear authors

I apologize for the tardiness of this review. You have made substantial edits and the article has significantly improved.

Well done!

I look forward to reading more of your work in the future.